

Chapter 1

Introduction to Managerial Accounting

Learning Objectives

After studying this chapter, you will be able to:

1. What are the relationships among managerial, cost, and financial accounting?
2. Understand how managerial accountants affect strategic decisions.
3. What are the managerial accounting, and functions?
4. What are the relationships among managerial and other sciences?

Chapter Contents

This chapter includes the following topics:

- Definition of Managerial Accounting
- Importance of Management Accounting Information
- Management Accounting Functions
- The Importance & Status of the Managerial Accountant
- Ethics for Management Accountants
- The Relationship between Managerial Accounting, Cost Accounting, and Financial Accounting
- The Relationship of Management Accounting with Other Sciences
- Questions

Chapter 1

Introduction to Managerial Accounting

By following the time events of the emergence and development of accounting systems in their current situation, it is noted that management accounting is the latest among these systems, as it was preceded by financial accounting and cost accounting, and because the administration needs to find an accounting system that keeps pace with developments and changes in the accounting environment, which focused on serving the administration in achieving its goals and its functions in planning, control, and decision-making, where administrative accounting had a major and effective role in assisting the administration in achieving these functions, as its emergence was accompanied by a coincidence after the end of World War II in 1945. The American production facilities and companies were transformed from the nature of military production to the nature of civilian production, which led to a decrease in efficiency and productivity in most of the facilities, which required the formation of an "Anglo-American" working group to visit these facilities to determine the reasons for the decrease in productivity, where the title of this report was "Management Accounting".

Where it was defined as "the adaptation of accounting data and

information to serve the administration in the daily conduct of its projects and companies,” and we can conclude from this simplified concept that management accounting has the main objective of providing data and analytical accounting information to the administration to help it exercise its functions to the fullest extent of planning, control, and decision-making.

Definition of Managerial (Management) Accounting

Shortly after the emergence of management accounting, this new accounting system was taken into account as the focus of the link between accounting and management, as it was known by several definitions, all aimed at showing its contribution to achieving the goals of management represented in planning, control, and assistance in decision-making, and these definitions are:

Managerial Accounting: “The accounting system for providing the quantitative information that managers need in planning and controlling”.

Managerial Accounting: “It is an application of appropriate means, measures, and concepts in order to create historical data expected for any institution to assist the management in developing plans to achieve reasonable goals and to make wise decisions to

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achieve those goals”.

Managerial Accounting: “A set of principles, methods, and measures that are adopted in preparing plans for projects' budgets for a future period, monitoring the implementation of these plans, and preparing the necessary accounting data for the purposes of decision-making in the planning and control stage”.

The Institute of Management Accountants (IMA), the world's leading professional organization for management accountants and financial professionals, first defined management accounting in 1981 as “The process of identification, measurement, accumulation, analysis, preparation, interpretation, and communication of financial information used by management to plan, evaluate, and control within an organization and to assure appropriate use of and accountability for its resources.”

After more than a quarter of a century, specifically in December 2008, the IMA issued a revised definition of management accounting in appreciation of the strategic role it plays in today's institutions. This definition is:

“Management accounting is a profession that involves partnering in management decision making, devising

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planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization's strategy".

Importance of Management Accounting Information

The role of management accounting information, like other information systems, is to increase knowledge and reduce the risk of uncertainty, and unlike descriptive or personal information management accounting information is usually analytical whether quantitative or objective, that will help the decision maker more effectively than if it were as well as descriptive or personal and given the importance of accounting information in general considering that management accounting is one of the sub-systems of the comprehensive accounting system, it must be described as follows:

What are Management Accounting Information described by?

1. Relevance: The relevance or suitability of accounting information is one of the most important characteristics that must be characterized by this information to use when studying the problem that needs to be solved, addressed, and decided upon.
2. Timeliness: Meaning that the need for accounting information is a current and immediate need, that is, it is required at the right

time, and that much important accounting information loses its value when the time specified for its request has passed.

3. Accuracy & Precision: It is a characteristic of a great degree of importance because there is no point in obtaining information quickly, but it is inaccurate and erroneous as false and misleading information will lead the manager to make inaccurate decisions affecting the economic situation of the enterprise.

Management Accounting Information Function

There is a group of functions that management accounting information seeks to achieve, which are as follows:

- 1. Operational Control:** Provide feedback information about the efficiency & quality of tasks performed.
- 2. Product & Customer Costing:** Measure the cost of resources used to produce a product or service, market & deliver the product or service to customers.
- 3. Management Control:** Provide information about the performance of managers & operating units.
- 4. Strategic Control:** Provide information about the enterprise's financial & long-run competitive performance, market conditions, customer performance, & technological innovations.

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The Importance & Status of the Managerial Accountant

The management accountant occupies great importance and a distinguished position in the economic unit, as it is the focus point of the economic unit, as it takes data from various departments and in turn collects and classifies these data and converts them into useful information that it provides to senior management as well as to the various departments, and the management accountant is the closest to the management from the rest of the accountants in the economic unit, as it contributes to the strategic decisions taken by the management by providing important and necessary information about the sources of competitive advantage. Here, the management accountant has to rely on information for management accounting, as it stems from the credibility, accuracy, and timeliness of the flow of this information, as any defect or inaccuracy can lead to wrong decisions and wrong evaluations of performance. //

Ethics for Management Accountants

In 1983, the National Association of Accountants (NAA) issued a code of ethics for management accountants, both CMAs (Certified Management Accountant and others. Although individuals who practice as independent certified public accountants have been subject to the Code of Conduct for many decades, these standards

are a first for management accountants and may serve to increase public confidence in the integrity of the business community. The main contents of this Code of Ethics, Standards of Ethical Conduct for Management Accountants are set out as follows:

المعاداة

1. Competence: The management accountant must maintain a level of professional competence through the continuous development of their knowledge and skills, while performing duties in accordance with approved laws, regulations, and standards, and preparing clear and complete analytical reports that include the required recommendations.

السرية

2. Confidentiality: Refrain from disclosing confidential information obtained during their work except under a legally binding authorization, with the requirement to inform only direct subordinates of this information to ensure confidentiality, and not to use confidential information for the unethical or illegal benefit either personally or through third parties.

الزفاعة

3. Integrity: refrain from engaging in any activity that would harm their ability to perform their duties ethically, refuse any gift, service, or hospitality that would affect them, avoid conflict of interest and refrain from engaging in or supporting any activity that harms or tarnishes the reputation of the facility and the

profession, identifying professional limitations that impede the successful performance and reporting of the activity, and the transmission of unfavorable information as well as supporting judgments or professional opinions.

4. Objectivity: Full disclosure of all relevant information with fair and objective communication regarding what is contained in the report, comments, and recommendations made.

5. Resolution of Ethical Conflict: When applying standards of ethical behavior, management accountants may have problems identifying unethical behavior or in resolving ethical conflicts. When faced with significant ethical issues, management accountants must follow the policies in place in the organization that affect the resolution of such conflict, and if these policies do not resolve the ethical conflict, management accountants should discuss these issues with the line manager, and when they are not resolved it is submitted to the top management level, and so on.

The Relationship between Management Accounting, Cost Accounting & Financial Accounting

The integrative relationship and the close interrelationship between management accounting on the one hand, and cost accounting and financial accounting on the other hand, can be

clarified initially, through the definitions of each type of accounting system, as follows:

Management (Managerial) Accounting: The accounting system provides managers with the quantitative and analytical accounting information they need in planning, controlling, and decision-making.

Cost Accounting: An accounting system for providing managers with the quantitative information they need in planning, controlling and determining the cost of the activity (product or service).

Financial Accounting: An accounting system that provides managers with the quantitative information they need to prepare financial statements for external users.

Through the simplified definitions and the objectives that the sub-systems (financial accounting, cost accounting, & management accounting) seek to achieve, the comprehensive and integrated accounting information system can be clarified in the following diagram.

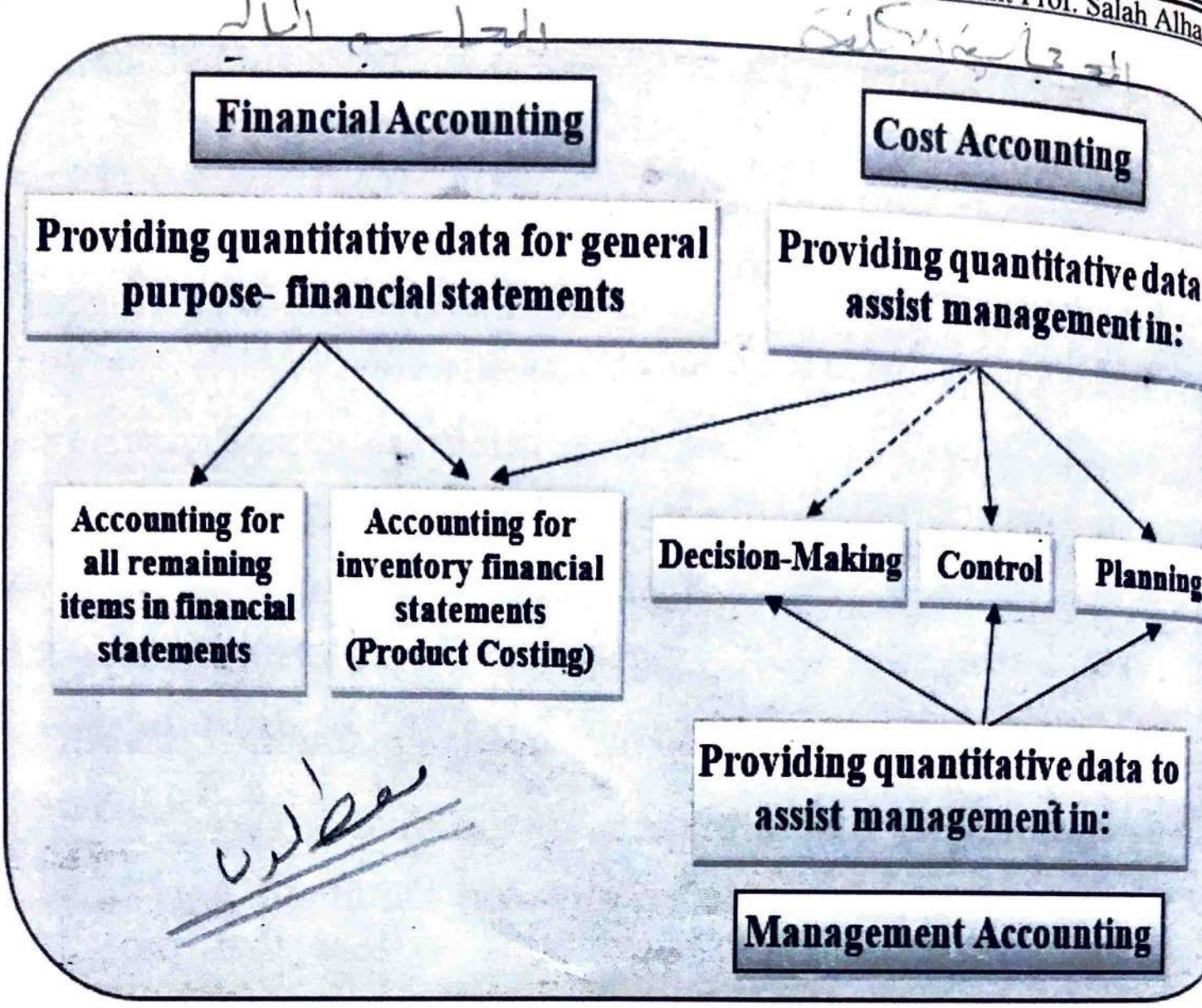


Chart (1)

The Relationship between Management Accounting, Cost Accounting & Financial Accounting

The Relationship (Differences) between Managerial Accounting & Financial Accounting:

The relationship between management accounting and financial accounting, although financial accounting is the main source of data and accounting information that management accounting needs for the purposes of planning, controlling, evaluation, and assistance in decision-making, but is characterized by fundamental differences in objectives

functions and the field of use of each type, and these can be clarified the differences are in the following table:

مطلوب

Item	Financial Accounting	Managerial Accounting
1. Information users	Investors, creditors, & other users external to the organization after audit	Managers, employees, & decision makers internal to the organization
2. Purpose of information	To provide financial statements that will be meaningful to any interested parties	To assist management in planning, controlling & decision making
3. Flexibility of accounting reports	Inflexible in preparing financial accounting reports because it depends on GAAP مبادئ المحاسبة المقبولة	Flexibility in preparing management accounting reports as it sometimes does not depend on GAAP
4. Time dimension	Relates primarily to the past	Deal with relates substantially to the future
5. Focus of information	Usually takes a condensed view of the organization as a whole	Takes a detailed view of segment of the organization
6. Nature of information	Monetary information نقدية	Monetary, quantitative & any type of information

Chart (2)

The relationship (difference) between Management Accounting & Financial Accounting

The Relationship between Managerial Accounting & Cost Accounting:

Accounting:

The role of management accounting begins at the end of cost accounting through analyzing data and lists of cost information

prepared by cost accounting, and describing the relationship between these two accounting systems reliably, as some writers do not differentiate between them, and we find that most of the books of management accounting deal with the topics of cost, and vice versa also, in the books of cost accounting, where they include important topics of management accounting, and some felt this relationship as two tributaries poured in one stream, namely the service of management in the areas of planning and control and in the decision-making, where cost accounting generally focuses on short-term planning and control. Relying on historical and current data for reporting, as for management accounting, focuses on short-term as well as long-term planning and control as it relies on historical, current, and future predictive data to formulate plans and strategies as it provides a future vision for the company. Hence, it makes use of forecasting what the costs will be in the future if a particular alternative is chosen. Accordingly, the managers can select the best alternative for the company.

The Relationship of Management Accounting with other Sciences

Management accounting as a fundamental pillar of accounting science is closely related to various sciences, including:

1. Management Science: Accounting and managerial accounting in particular, is an important means of serving management, as it

provides useful information to management that helps it achieve its most important goals of planning, control and decision-making.

2. Economics Science: It will discuss how to allocate resources and scarce factors of production between the projects to achieve maximum benefit from these resources, as well as consider things such as multiple benefits, price, inflation, opportunity cost, and marginal cost, and find an effective role in the collection of the data needed to follow the evaluation and evaluation process.

3. Statistics and Mathematics Science: It relies on management accounting methods and mathematical methods and statistical and quantitative analysis and presentation of the results of the analysis of the financial statements and lists of costs.

Chapter 2

Cost Concepts & Cost Behavior

Learning Objectives

After studying this chapter, you will be able to:

1. Understand the meaning of the term cost, and some concepts related to it.
2. How are costs classified, and why are such classifications useful?
3. Classify an expenditure as fixed, variable, or mixed.
4. Compute the fixed and variable components of costs by three methods.

Chapter Contents

This chapter includes the following topics:

- Definition of Cost
- Classification of Cost
- Separation of Mixed Costs
- Other Cost Concepts
- Questions & Exercises

Chapter 2

Cost Concepts & Cost Behavior

Definition of Cost

Many definitions have been presented in many scientific references specialized in the accounting affairs of the term cost, but the definition of the American Institute of Certified Public Accountants (AICPA) has been relied upon as being the most accurate and clear definition of cost:

"An exchange price, a forgoing, a sacrifice made to secure benefit. In financial accounting, the forgoing or sacrifice at date of acquisition is represented by a current or future diminution in cash or other assets".

Cost can be defined by another, more detailed, and comprehensive definition.

"Exchange rate, sacrifice for the guarantee of benefit, which represents the amount measured in spent cash or any property paid, shares issued, services rendered, or debt created in exchange for goods or services".

From what was mentioned in the above definitions, the cost characteristics can be deduced as follows:

- 1- It is an economic sacrifice of part of the enterprise's resources.
- 2- Ensuring obtaining a benefit, which may be immediate or future.

3- It is measured in cash spent.

4- It is within the standard concept of use, that is, it does include only permissible losses.

5- The cost is determined according to the following equation

$$\text{Cost} = \text{Quantity} \times \text{Price}$$

Classification of Cost

Cost classification is needed for the development of cost that will aid management in achieving its objectives. The classifications are based on the relationship of costs to:

1. **Natural classification**; According to these relationships, cost can be classified according to its nature into three elements components: (Material cost, Labor cost, and Expenses)

2. **Functional classification**; According to these relationships the cost is classified according to the function in which it arises and the purpose of this classification is to link the cost elements to the function in which my agencies are established:

(Manufacturing costs, Marketing costs, and Administrative costs)

3. **Cost in relation to the unit of product**; According to these relationships, cost components are classified into:

a) **Direct Costs**: Costs that can be traced easily to the unit product manufacturing: (Direct material, Direct labor, and Direct expense)

b) Indirect Costs: Costs that can't be traced easily to the unit product: (Indirect manufacturing costs {F.O.H}, Marketing costs, and Administrative costs).

صحة التكلفة

4. Cost in relation to volume of activity (Cost behavior analysis); Some costs vary in total directly with changes in production activity, while others remain relatively unaffected.

Success in planning and controlling cost depends upon careful study and analysis of the relationship of cost to changes in business activity and according to these relationships, the cost can be classified into fixed, variable, and mixed costs:

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a. Fixed Costs: Costs that are unchanged in total at all levels of activity within a limited range of activity (relevant range).

أقصى المداخ

The Characteristics of Fixed Costs:

There are several characteristics of fixed costs, which are:

المدى المداخ المحسب لها

1. The fixed total amount within a relevant output range.
2. A decrease in per-unit cost as volume increases within a relevant range.
3. Assignable to departments based on arbitrary managerial decisions or cost allocation methods.
4. Control responsibility resting with executive management rather than operating supervisors.

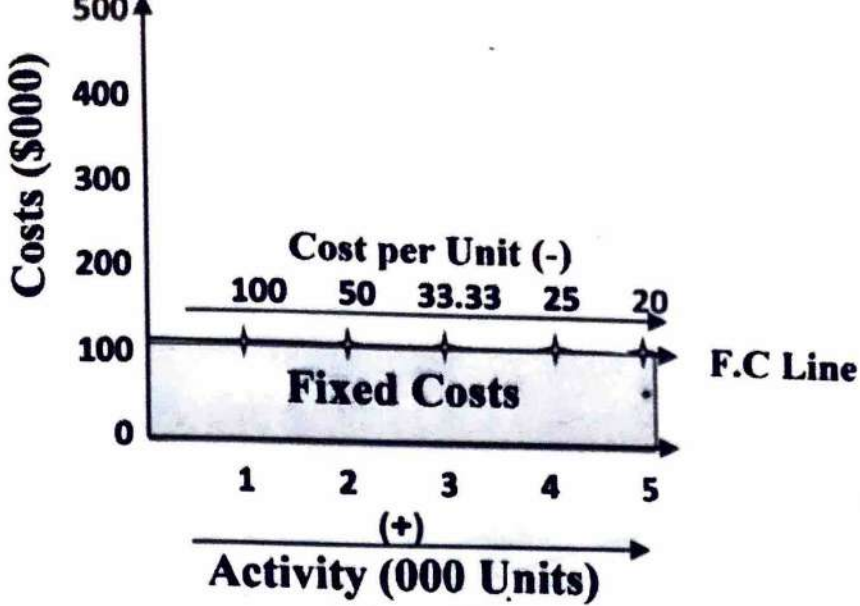


Chart (3)

Fixed costs behavior

It is noted from the graph that the efficiency of the department's performance is measured by the extent to which the full available capacity is utilized, as fixed costs are distributed over the largest possible number of units to reach a low share of the unit cost.

b. Variable Costs: Costs that change proportionally to the volume of production (or sales).

The Characteristics of Variable Costs:

There are several characteristics of variable costs, which are:

1. The change in the total amount is in the same proportion as the change in the volume of activity.
2. Relatively constant cost per unit as volume changes within a relevant range.
3. Assignable, with reasonable ease and accuracy, to operating departments.
4. Controllable by a specific department head.

c. Mixed Costs: Those elements whose cost varies according to the volume of activity, but not at the same rate of change, and accordingly the total costs, as well as the cost per unit, will be variable, and therefore their cost will contain the fixed and variable components, for example; Maintenance exp. [Regular maintenance (F) & sudden maintenance (V)], electricity exp. [lighting (F) & operating machines (V)], supervisor wage [monthly salary (F) & production incentives (V)], and it can be classified into two types:

- **Semi-Fixed Costs:** When fixed costs are more than variable costs.

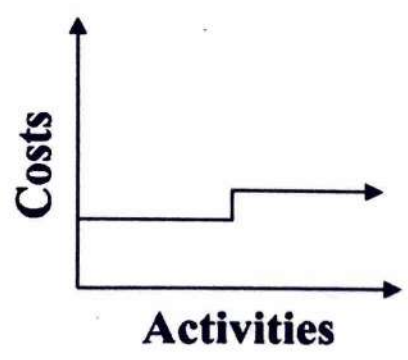


Chart (5)
Semi Fixed Costs

- **Semi-Variable Costs:** When variable costs are more than fixed costs.

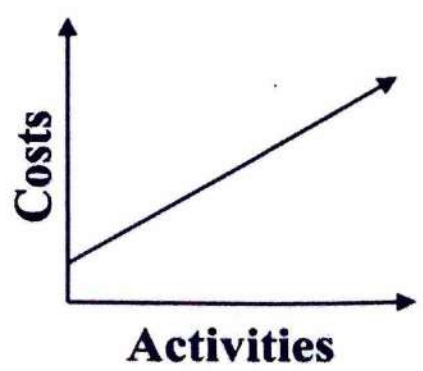


Chart (6)
Semi Variable Costs

Expected expenses for (5000 units) in July:

Rent expense		\$ 6000
Indirect materials cost (5000 × 2)		10000
Maintenance expense 6000 + (5000 × 1.5)		13500

Other Cost Concepts

It is not possible to define an accurate concept of the term cost except with the knowledge of the purpose to be used in the area of measurement, control, planning, and decision-making.

Therefore, some concepts related to the term cost will be clarified.

1. Common Cost: The cost of operating a facility operating in a common activity area, or cost object that is shared by two or more users.

2. Joint Cost: Costs of a single process that yields multiple products simultaneously.

3. Marginal Cost: The increase in total costs resulting from increasing production by one unit, and this increase is only related to the variable part of the costs.

The total costs of producing 1000 units amounted to \$ 140000, the variable of which is \$ 80000 and the fixed \$ 60000, when the production increases to 1001 units the total costs are \$ 140080, and accordingly, the increase in total costs amounting to \$ 80 is considered the marginal cost.

4. Product Cost: A sum of the cost assigned to the product for a specific purpose.
 تكاليف جارية عن طريق

5. Period Cost: A sum of the cost assigned to a specific period.
 تكاليف الفترة

As for the relationship of costs to the period, it is classified to:

a. Capital Expenditures: This is intended to benefit future periods & his record as an asset.
 المصاريف الرأسمالية

b. Revenue Expenditures: Benefit the current period & his record as expenses.
 المصاريف الأخرى

6. Relevant Costs & Irrelevant Costs:

a. Relevant Costs: Expected future costs that differ among alternative courses of action.
 تختلف بين
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b. Irrelevant Costs: These are those costs that remain for the same alternatives being considered.

c. Sunk Costs: Past costs that are unavoidable because they can't be changed no matter what action it takes.

d. Differential Costs: These are also called incremental costs, which are the difference between the costs of each alternative action that is being considered.
 تدرجية

e. Opportunity Cost: The amount of lost profit when the opportunity afforded by one alternative is sacrificed to pursue another alternative.

7. Controllable Costs & Non – Controllable Costs:

a. Controllable Costs: Costs are those that can be influenced by a manager during a period of time.

b. Non – Controllable Costs: Costs are those that cannot be influenced by a manager during a period of time.

8. Avoidable & Unavoidable costs:

a. Avoidable Costs: It is the cost that is ^{مستبعد} eliminated when deciding to choose an alternative without another alternative in which these costs arose.

b. Unavoidable Costs: It is the cost that is not eliminated when deciding to choose an alternative without another, as they remain in each alternative.

v
a.
b.
c.
d.
e.
f.

Chapter 3

Cost – Volume – Profit (C.V.P.) Analysis

Learning Objectives

After studying this chapter, you will be able to:

1. What is the concept and assumptions of CVP analysis?
2. How are the different methods used in calculating B.E.P?
3. How can a company use volume-profit (VP) analysis?
4. Knowing the margin of safety and operating leverage?
5. How is break-even analysis applied to multiple products?

Chapter Contents

This chapter included the following topics:

- Definition of the Break-Even Point
- C.V.P Analysis Assumptions
- Methods of computing the Break-Even Point
- Sensitivity Analysis
- The Margin of Safety
- The Relationship between Profit & Volume
- The Target Profit
- Break-Even Point Conclusions
- Operating Leverage
- Multi-Product (Sales Mix) CVP Analysis
- Questions & Exercises

Chapter 3

Cost-Volume-Profit (C.V.P) Analysis

Break-even analysis is a systematic way of examining the relationship between changes in the volume of production and changes in total sales revenue, expenses (costs), and net profit. It is one of the most important factors and indicators that help management understand and evaluate the relationships between costs and activity volume as a result of their interaction and impact on the amount of profits and it allows us to predict what will happen to financial results if it is at a certain level of activity or when the volume of activity changes. It also shows the impact of potential or planned changes that affect the amount of expected net profit, selling price, sales volume, cost structure, level of costs, and the selling mix of various products, in addition to this, this analysis is one of the most important analytical tools in the planning process as long as the focus is based on the relationship between costs, volume, and profit (C.V.P), and in the short run, this is usually a period of one year, or less, during which the company's output is likely to be limited to that available from current operating capacity. Some inputs can be increased in the short run but others cannot be increased, additional supplies of materials and unskilled labor can be obtained at short notice, but the operational capacity cannot be changed significantly.

Definition of the Break-Even Point

The common definition of the break-even point can be defined as follows:

“That volume of activity for which total revenue is equal to total costs where operating income is zero”.

The above definition is derived from the mathematical relationship, and the following definition is derived from the graph that shows the break-even point:

“That point resulting from the intersection of the total cost line and the total revenue line where operating income is zero”.

C.V.P Analysis Assumptions:

For the results of the analysis to be correct, it is necessary to specify the CVP assumptions.

These basic assumptions are as follows:

1. Total revenue and total costs must be linear functions.
2. Constant selling price, unit variable cost, and total fixed costs over the relevant range, and can be accurately identified.
3. The possibility of separating costs into fixed and variable items.
4. Profits are calculated on a variable costing basis.
5. All units produced must be sold.
6. To analyze multiple products, the sales mix must be known.
7. The analysis is only applicable in the short term.

Methods of computing the Break-Even Point

There are several methods for computing the Break-even point, note that CVP analysis can only be used for decisions that lead to results within the relevant range (according to the available data), but if data outside this range is relied upon, the selling price and variable cost are no longer fixed per unit and any results obtained will be incorrect, these methods are:

1. The Mathematical (Equation) Approach.
2. The Contribution Margin Approach.
3. The Graphical Approach.

The following example can illustrate how to use these methods in determining the break-even point.

Example No.1 : The following data are available:

The variable cost per unit is \$60.

Total Fixed costs are \$200000.

The selling price per unit is \$100.

Required: Using the three methods to compute the break-even point (B.E.P) in units and dollars (amounts).

The solution:

1st Method: The Mathematical (Equation) Approach:

i. **Revenues - Total Costs = Operating Income (Profit)**

$$(Units\ Sold \times S.P^{*1}) - (F.C^{*2} + V.C^{*3}) = 0$$

$$(Q^{*4} \times 100) - (200000 + \{Q \times 60\}) = 0$$

$$40 Q = 200000$$

∴ $Q = 200000 \div 40 = \underline{5000}$ units → **B.E.P in Units.**

*1 S.P = Selling price per unit

*2 F.C = Fixed cost per period

*3 V.C = Variable cost per unit

4 Q = Quantity of units

ii. **B.E.P. in Dollars** = $5000 \times 100 = \underline{\$ 500000}$

To make sure:

Revenue (R)	500000
Variable Costs (V.C)	(300000)
Contribution Margin (C.M)	200000
Fixed Costs (F.C)	(200000)
Net income (N.I)	0

2nd Method: The Contribution Margin (C.M) Approach:

This approach is used to determine the break-even point in units (according to the concept of contribution margin), as well as in dollars (according to the concept of contribution margin).

and as follows: *حالت المسألة*

i. The contribution margin is defined as:

“The contribution of each product to covering part of the fixed costs until they are fully covered, and profit begins to appear”.

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نقطة

The break-even point in units can be computed by the following formula:

B.E.P in Units = Fixed Costs ÷ Contribution Margin per Unit^{*1}

^{*1} Contribution Margin (C. M) per unit = S.P – V.C

∴ B.E.P in units = 200000 ÷ (100 – 60) = 5000 units

ii. The contribution margin ratio (also known as the contribution sales ratio or profit-volume ratio), is defined as:

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“The proportion of each \$1 of sales available to cover fixed costs and provide for profit”.

The break-even point can be computed in dollars by the following formula:

B.E.P in Dollars = Fixed Costs ÷ Contribution Margin Ratio^{*2}

^{*2} C.M Ratio = C.M ÷ S.P

200000 / 100 → 2000

∴ C.M Ratio = (S.P- V.C) ÷ S.P

∴ B.E.P in dollars = 200000 ÷ $\frac{40}{100}$ = \$ 500000

Sensitivity Analysis

This is one approach for coping with changes in the values of the variables. Sensitivity analysis focuses on how a result will be changed if the original estimates or the underlying assumptions change.

The following example illustrates this:

Example No.2 : Al-Mosul Company manufactures and sells a specific type of Teapot, the present sales output is 50000 teapots per year at a selling price of \$ 4 per teapot, the fixed costs for the year are \$ 60000, and the variable cost is \$ 2.50 per teapot.

Required:

- Compute the current break-even point in units.
- Compute the new B.E.P. in units for each of the following changes (Consider each case independently):

- A 10% increase in F.C.
- A 20% increase in selling price & a \$ 20500 increase in F.C.
- A \$ 0.10 per unit decrease in V.C.

The solution:

$$\begin{aligned}
 \text{a. B.E.P in Units} &= \text{F. Costs} \div \text{C.M per Unit} \\
 &= 60000 \div (4 - 2.50) \\
 &= 60000 \div 1.5 \\
 &= 40000 \text{ units}
 \end{aligned}$$

$$b. \text{ B.E.P in Units} = F. \text{ Costs} \div C.M \text{ per Unit}$$

$$i. = 66000 \div (4 - 2.50)$$

$$= 66000 \div 1.50$$

$$= \mathbf{44000 \text{ units}}$$

$$ii. = 80500 \div (4.80 - 2.50)$$

$$= 80500 \div 2.30$$

$$= \mathbf{35000 \text{ units}}$$

$$iii. = 60000 \div (4 - 2.40)$$

$$= 60000 \div 1.60$$

$$= \mathbf{37500 \text{ units}}$$

حاضر الامان

The Margin of Safety (Safety Margin)

It is the ^{الفارق بينهما} excess of budgeted revenue over the break-even revenue. This area is located above the break-even point and the profit is realized. The higher margin of safety, the lower the risk of loss or break-even.

1. Margin of Safety in Units; It is computed by the following formula:

$$\text{Margin of Safety in Units} = \text{Budget or Actual Sales in Units} - \text{Break Even Point in Units}$$

2. Margin of Safety in Revenue; It is calculated by the following formula:

$$\text{Margin of Safety in Revenue (Dollars)} = \text{Budget or Actual Sales Revenue} - \text{Break Even Point in Dollars}$$

3. **Margin of Safety Ratio**; It is computed by the following formula:

$$\text{Margin of Safety Ratio} = \frac{(\text{Margin of Safety} \div \text{Budget or Actual Sales}) \times 100\%}{\text{Sales}}$$

Example No.3: Referring to example No.1, assume the budget sales are 7000 units.

Required: Determine margin of safety in units, revenues, and ratio.

The solution:

$$\begin{aligned} \text{Margin of Safety (M.S) in Units} &= 7000 - 5000 \\ &= \mathbf{2000 \text{ units}} \end{aligned}$$

$$\begin{aligned} \text{Margin of Safety in Revenue} &= 700000 - 500000 \\ &= \mathbf{\$200000} \end{aligned}$$

$$\begin{aligned} \text{Margin of Safety Ratio} &= (200000 \div 700000) \times 100\% \\ &= \mathbf{28.57\%} \end{aligned}$$

The Relationship between Profit & Volume

Most organizations with different activities and specializations, use the relationship between the volume of activity and the profits achieved in planning profits and productivity according to a particular activity. Some of the objectives of relying on this relationship can be clarified, as follows:

1. Determine the volume of the activity necessary to reach a certain

The Target Profit (T.P)

Most corporate departments resort to profit planning in advance, which requires determining the sales (in units or dollars) to be achieved to reach the target profit, which is usually determined before deducting income tax.

$$\text{Target Profit (T.P) Before Tax} = \text{T.P (After Tax)} + \text{Income Tax}$$

Or

$$\text{Target Profit (T.P) Before Tax} = \text{T.P (After Tax)} \div (1 - \text{Income Tax}\%)$$

The following example illustrates this:

Example No.4 : Referring to Example No.1, assume that the company wishes to earn an operating income after tax (40%) of \$72000.

Required: Determine the volume of sales in units and dollars to achieve the target profit.

The solution:

- In the beginning, compute the operating income before tax.

$$\begin{aligned}
 \text{Operating Income (O.I) before tax} &= \text{O.I (after tax)} \div (1 - \text{income tax } \%) \\
 &= 72000 \div (1 - 40\%) \\
 &= 72000 \div 60\% \\
 &= \$ 120000
 \end{aligned}$$

1st Method:

Target Profit (T.P) = Revenues – Total Costs

$$120000 = 100 \text{ S.Q} - (200000 + 60 \text{ S.Q})$$

$$320000 = 40 \text{ S.Q}$$

$$\therefore \text{S.Q (Sales Quantity)} = 320000 \div 40 \\ = \mathbf{8000 \text{ units}}$$

$$\therefore \text{Sales in Dollars} = 8000 \times 100 \\ = \mathbf{\$ 800000}$$

2nd Method:

$$\text{Sales in Units to achieve T.P} = (\text{F.C} + \text{T.O.I}) \div \text{C.M} \\ = (200000 + 120000) \div 40 \\ = \mathbf{8000 \text{ units}}$$

$$\text{Sales in Dollars to achieve T.P} = (\text{F.C} + \text{T.O.I}) \div \text{C.M Ratio} \\ = (200000 + 120000) \div (40/100) \\ = \mathbf{\$ 800000}$$

3rd Method: Relationship of volume and profit graphically

For an easy understanding of the relationship between target profit and sales volume, most executives use the graphical approach to quantify sales or dollars to know the target profit.

To clarify the relationship between profit and sales volume graphically, the following steps must be followed:

1. Drawing the x-axis, which represents

Operating Leverage

In commercial activity, this term is considered a tool to measure the extent to which profits are affected by changes in the value of sales. Operating leverage is defined as:

“A measure of how sensitive net operating income is to a percentage change in dollar sales”

Operating leverage acts as a multiplier, if operating leverage is high, a small percentage increase in sales can produce a larger percentage increase in net operating income. The degree of operating leverage at a given level of sales is computed by the following formula:

$$\text{Degree of operating leverage} = \frac{\text{Contribution margin}}{\text{Net operating income}}$$

It is also possible to determine the relationship between the percentage change in sales volume with the percentage change in net operating income according to the concept of operating leverage, with the following formula:

$$\text{Percentage change in net operating income} = \text{Degree of operating leverage} \times \text{Percentage change in sales}$$

It is also possible to determine the relationship between the margin of safety and the degree of operating leverage, with the following formula:

$$\text{Margin of safety ratio} = 1 \div \text{Degree of operating leverage}$$

It can be illustrated how the degree of operating leverage is computed by the following example:

Example No.9 : The following are the income statements for two companies (X) and (Y) for the year ended 31/12/2023:

Details	(X) Company	(Y) Company
Revenue	\$ 300000	\$ 300000
- Variable Costs	<u>(120000)</u>	<u>(210000)</u>
Contribution Margin	180000	90000
- Fixed Costs	(120000)	(30000)
Net Operating Income	\$ 60000	\$ 60000

Required:

1. Compute the contribution margin percentage and B.E.P for each company.
2. Compute the operating leverage for each company.
3. Compute the margin of safety in dollars for each company.
4. Both companies have planned to increase their sales volume in 2024 by 10%. Explain the reason for the difference in net operating income between the two companies according to the concept of operating leverage.

The solution:

1. Contribution margin percentage = $C.M \div \text{Sales}$
 $C.M \% \text{ for (X) Company} = 180000 \div 300000 = 60 \%$

C.M % for (Y) Company = $90000 \div 300000 = 30\%$

B.E.P in Dollars = Fixed Costs \div C.M %

B.E.P in Dollars (X) = $120000 \div 60\% = \$ 200000$

B.E.P in Dollars (Y) = $30000 \div 30\% = \$ 100000$

2. Degree of operating leverage = $\frac{\text{Contribution margin}}{\text{Net operating income}}$

(X) Company = $180000 \div 60000 = 3$

(Y) Company = $90000 \div 60000 = 1.5$

3. Margin of safety Ratio = $1 \div$ Degree of operating leverage

The margin of safety Ratio for (X) = $1 \div 3 = \frac{1}{3}$

\therefore Margin of safety in dollars for (X) = $300000 \times \frac{1}{3} = \100000

The margin of safety Ratio for (Y) = $1 \div 1.5 = \frac{2}{3}$

\therefore Margin of safety in dollars for (Y) = $300000 \times \frac{2}{3} = \200000

4. Budget Income Statement for the year ended 31/12/2024

Details	(X) Company	(Y) Company
Revenue	\$ 330000	\$ 330000
- Variable Costs	<u>(132000)</u>	<u>(231000)</u>
Contribution Margin	198000	99000
- Fixed Costs	(120000)	(30000)
Net Operating Income	\$ 78000	\$ 69000

The change in net operating income = N.O.I (2024) - N.O.I (2023)

(X) Company = $78000 - 60000 = \$ 18000$

∴ The degree of operating leverage for (X) is 3.

∴ The company's net operating income grows 3 times as fast as its sales.

$$\begin{aligned} \text{Percentage change in net operating income} &= \text{Degree of operating leverage} \times \text{Percentage change in sales} \\ &= 3 \times 10\% \\ &= 30\% \end{aligned}$$

∴ The change in net operating income = 60000 × 30% = \$18000

$$\begin{aligned} \text{The change in net operating income} &= \text{N.O.I (2024)} - \text{N.O.I (2023)} \\ \text{(Y) Company} &= 69000 - 60000 = \$ 9000 \end{aligned}$$

∴ The degree of operating leverage for (Y) is 1.5.

∴ The company's net operating income grows 1.5 times as fast as its sales.

$$\begin{aligned} \text{Percentage change in net operating income} &= \text{Degree of operating leverage} \times \text{Percentage change in sales} \\ &= 1.5 \times 10\% \\ &= 15\% \end{aligned}$$

∴ The change in net operating income = 60000 × 15% = \$ 9000

The difference in the net operating income of the two companies is due to the operating leverage, which in turn a company whose operating leverage is higher (3) is the one whose profits are higher.

Conclusions regarding operating leverage:

Through the use of operating leverage as a measure of sensitivity of net operating income to the change in the sales of commercial companies, the following conclusions can be drawn:

1. The company with the higher proportion of fixed cost structure, will have higher operating leverage.
2. The company whose breakeven point is higher, will have higher operating leverage.
3. The degree of operating leverage is not a constant; it is high at sales levels near the break-even point and decreases as sales and profits rise.
- 4- The margin of safety percentage is the inverse of the degree of operating leverage.

Multi-Product (Sales Mix) CVP Analysis:

Most establishments produce and sell more types of goods and services. They may differ in terms of the selling price and the variable cost per unit of each type of commodity, and therefore the margin of contribution per unit will differ for each type, and it is known that fixed costs are the costs that have been incurred during the period that are period costs and are not related to production. It is difficult to determine the share of each type of these costs in addition to the impracticability of computing the break-even-point for

component separately, and in order to address this deficiency, this technique is used to compute the total breakeven point of the sales mix, and then determine a point for each commodity according to its contribution to the percentage of the sales mix.

1. The B.E.P (Sales Mix) in Units; It is computed according to the following formula:

$$\text{B.E.P (Sales Mix) in Units} = \text{F.C} \div \text{C.M Average}^*$$

* C.M Average = Total C.M \div Total Units Sold

2. The B.E.P (Sales Mix) in Dollars; It is computed according to the following formula:

$$\text{B.E.P (Sales Mix) in Dollars} = \text{F.C} \div \text{Total C.M Ratio}^*$$

*Total C.M Ratio = Total C.M \div Total Sales Revenue

Example No.10 : The following data is available for Stars Co.:

Details / Products	M	Z	Total
Units Sold	4000	6000	10000
Sales Revenue	120000	300000	420000
- Variable Costs	(80000)	(210000)	(290000)
Contribution Margin	40000	90000	130000
- Fixed Costs	--	--	(78000)
Net Income			52000

Required: Compute the B.E.P in units and revenue (dollar) for the sales mix and each product.

The solution:

$$\begin{aligned} \text{B.E.P (Sales Mix) in Units} &= \text{F.C} \div \text{C.M Average} \\ &= 78000 \div \frac{130000}{10000} \\ &= \mathbf{6000 \text{ units}} \end{aligned}$$

$$\begin{aligned} \text{B.E.P for Product M} &= 6000 \times \frac{4000^{*1}}{10000} \\ &= \mathbf{2400 \text{ units}} \end{aligned}$$

*1 The percentage of product sales out of the sales mix.

$$\begin{aligned} \text{B.E.P for Product Z} &= 6000 \times \frac{6000}{10000} \\ &= \mathbf{3600 \text{ units}} \end{aligned}$$

$$\begin{aligned} \text{B.E.P (Sales Mix) in Dollars} &= \text{F.C} \div \text{Total C.M Ratio} \\ &= 78000 \div \frac{130000}{420000} \\ &= \mathbf{\$ 252000} \end{aligned}$$

$$\begin{aligned} \text{B.E.P for Product M} &= 252000 \times \frac{120000}{420000} \\ &= \mathbf{\$ 72000} \end{aligned}$$

$$\begin{aligned} \text{B.E.P for Product Z} &= 252000 \times \frac{300000}{420000} \\ &= \mathbf{\$ 180000} \end{aligned}$$

Example No.11 : The following data are available from records of The Red Light Company:

Details / Products	X	Y	Total
Units Sold	-	-	10000
Sales Mix Ratio (Unit)	40%	60%	100%
Selling Price per unit	\$ 30	\$ 50	
Variable Cost per unit	\$ 20	\$ 35	
Fixed Costs			78000

Required:

1. Compute the B.E.P in units and revenue (dollar) for the sales mix and each product.
2. Explain required No.1 with a diagram (chart).

The solution:^{*1}

$$\begin{aligned}
 \text{C.M Average} &= \left(\begin{array}{l} \text{C.M} \times \text{Sales Mix} \\ \text{per unit} \quad \text{ratio in unit} \\ \text{for X} \quad \quad \text{for X} \end{array} \right) + \left(\begin{array}{l} \text{C.M} \times \text{Sales Mix} \\ \text{per unit} \quad \text{ratio in unit} \\ \text{for Y} \quad \quad \text{for Y} \end{array} \right) \\
 &= (\{30 - 20\} \times 40\%) + (\{50 - 35\} \times 60\%) \\
 &= \mathbf{\$13 \text{ per unit}}
 \end{aligned}$$

$$\begin{aligned}
 \text{B.E.P in Units} &= 78000 \div 13 \\
 &= \mathbf{6000 \text{ units}}
 \end{aligned}$$

$$\begin{aligned}
 \text{B.E.P for Product X} &= 6000 \times 40\% \\
 &= \mathbf{2400 \text{ units}}
 \end{aligned}$$

$$\begin{aligned}
 \text{B.E.P for Product Y} &= 6000 \times 60\% \\
 &= \mathbf{3600 \text{ units}}
 \end{aligned}$$

^{*1} There is another method to solve, by preparing an income statement, as in Example No. 10, page 83.

Chapter 4

Decision Making and Relevant Information

Learning Objectives

After studying this chapter, you will be able to:

1. Define and compute the differential cost and relate it to short-term decision making.
2. Identifying a set of relevant decisions that have an effect on the costs and profits of the facility during the short term.

Chapter Contents

This chapter included the following topics:

- The concept of Relevance
- Types of Decisions
- Short-Term Decisions
- Accept or Reject a Special Order
- Make or Buy
- Adding and Dropping Product Line
- Scarce Resources Allocation
- Questions & Exercises

Chapter 4

Decision Making and Relevant Information

The Concept of Relevance :

Relevance is one of the important characteristics that must be met in accounting information so that it can be relied upon for differentiation between alternatives to make the appropriate decision.

The Relevant Information must meet two criteria:

1. It relates to the future.
2. They will be different for each alternative considered.

When this fails to meet either or both of these criteria it is considered Irrelevant Information.

It is noted that, in the long term, all items of costs are variable costs and are relevant to the decision-making process; but in the short term, it is limited to items whose costs are affected by changes in the volume of activity, that is, by different alternatives, and these items may be items of variable costs and fixed costs, which requires a comprehensive analysis of them, while the items that are not affected by the different alternatives are considered irrelevant for decision-making.

The following example illustrates the nature of information and relevant and irrelevant costs in the decision-making process.

Example No.1 : (X) Company is considering purchasing two new machines, each having a 4 years life, every machine produces the same product and every product requires the same amount of direct materials \$ 36000 per year. Machine 1, costs \$ 100000 & Machine 2, costs \$ 200000. The direct labor cost per year for Machine 1 is \$ 50000, and for Machine 2, is \$ 32000.

A supervisor who works for the company can oversee the operations of either machine, his annual salary is \$25000.

Required: Determine and compute the relevant & irrelevant costs.

The solution:

Items	Relevant Costs	Irrelevant Costs
Variable Costs	Direct Labor Cost \$ 50000 \$ 32000	Direct Materials Cost \$ 36000 per year
Fixed Costs	Depreciation expense \$ 25000 (100000 ÷ 4) \$ 50000 (200000 ÷ 4)	Supervisor Salary \$ 25000 per year

Through the above example, we conclude that relevant costs "Are those costs that vary from one alternative to another decision, whether they are fixed or variable costs. It must be characterized by two characteristics, the first being related to the future and the second being relevant for decision-making". And it is further noted that the costs are relevant not only the

monetary costs incurred by the company but go beyond it to another type of cost that does not appear in the records where the so-called **imputed (implicit) costs** (which are costs that are not considered actual costs of the cash flow of the business, but are taken into account when comparing the alternatives available, for the project because it represents a burden on the company because it is not able to use the available resources to the best use, so-called opportunity costs).

Opportunity Cost: "It's the profit forgone or lost by a firm in taking one course of action".

Or "The maximum contribution margin is lost to the firm as a result of preferring one alternative over another".

Example No.2 : A company that owns an additional building attached to its building that it uses to produce a limited-use product, it was offered to stop producing this product and rent the attached building for an amount of \$20000 annually.

Required: What is the opportunity cost? Explain this.

The solution:

It is noted that if the company refuses to rent the additional building, a return of \$20000 will be lost on it, as this amount is considered an opportunity cost for the company.

Therefore, it is not proven in the accounting records because it has

not actually been achieved in terms of receipt or expenditure, therefore it will be an imputed (implicit) cost that is used only for the purposes of differentiating between alternatives for the purpose of decision-making.

In addition to what is explained with regard to the irrelevant costs shown in Example No. 1, there is another type of these costs that do not affect the decision-making process called sunk costs.

Sunk Costs: It is represented in those sacrifices incurred (suffered) by the project in the past (recorded in the accounting records previously) so that they cannot be recovered now, so they are costs related to the past that does not affect the future decision-making process, and they are often inappropriate costs for decision-making and must be excluded in the case of a study or evaluating the different alternatives to decide on the best alternative, for example, the factory rent paid.

Types of Decisions

The decision-making process goes through a series of procedures starting with studying the problem, identifying alternatives, and choosing the best alternative for making the appropriate decision.

There are two types of decisions:

1. Short-Term Decisions
2. Long-Term Decisions (1)

(1) It will be discussed in the second part of this book (Managerial Accounting 2)

Short-Term Decisions

These decisions are related to dealing with one of the enterprise's activity variables, and this gives management the ability to control its level of activity. It is possible to know and identify these decisions in which the relevant costs have a role in making comparisons between the available alternatives. These decisions are:

1. Accept or Reject a Special Order.
2. Make or Buy.
3. Adding and Dropping Product Line.
4. Scarce Resources Allocation

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Each application of these decisions will be explained and illustrated:

1. Accept or Reject a Special Order

Some departments in the establishments do not take into account the cost elements that are affected by the changes in the production capacity, which makes them reject some orders, in particular, expect that the revenues will not cover the total cost, and the rejection process is hasty because it was not built based on correct analysis, as it is possible that the revenue generated from accepting the order, although it is less than the total costs of the order, can add additional profits to the business profits, and the reason is due to the existence of excess capacity established in the

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short term, and therefore this facility will bear the full fixed costs whether they were accepted or rejected your order, where fixed costs are considered irrelevant costs in the process of decision making.

To accept an order, the following conditions must be met:

- a. There must be excess productive capacity.
- b. The order must be from a customer in a market different from the one in which the manufacture normally sells an unrelated market.
- c. The selling price of the special order must be covered by the variable cost.

Example No.3 : The following data concerning the Moonlight Company for one month:

- a. Normal capacity of 10000 units per month.
- b. Units sold 8000 units @ \$ 100 per unit.
- c. Variable Cost per unit: Direct materials \$ 40, Direct labor \$ 20, F.O.H \$ 10, Marketing \$ 5.
- d. Fixed Costs per month: Factory overhead \$48000, Marketing & Administration \$32000.
- e. The Sunrise Company in another market would like to buy 2000 units at \$80 a unit.

Required: Present computations showing whether the company would accept this special order or not for the Sunrise Company.

The solution:

Differential revenue & costs analysis for decision of accept or reject a special order

Items	Reject The Order (Original Case) 8000 units		Accept The Order (Alternative Case) 10000 units		Difference	
Sales		800000		960000		160000
-Variable Cost:						
Direct Materials 40	320000		400000		(80000)	
Direct Labor 20	160000		200000		(40000)	
F.O.H 10	80000		100000		(20000)	
Marketing 5	<u>40000</u>		<u>50000</u>		<u>(10000)</u>	
		(600000)		(750000)		(150000)
Contribution Margin		200000		210000		10000
-Fixed Cost :						
F.O.H	48000		48000		0	
Marketing & Administration	<u>32000</u>		<u>32000</u>		<u>0</u>	
		(80000)		(80000)		0
Net income		120000		<u>130000</u>		10000

Decision: The Sunrise Company's offer must be accepted because it increased the company's profit by \$10000.

2. Make or Buy:

The decision to manufacture or buy relates to the comparison between purchasing a commodity or service or using the own resources to produce that good or service from the local or foreign market, as the comparison aims to determine the best use of the productive resources available to the facility, especially when there is the surplus capacity (unused), the availability of technical capabilities and skills of the workers and the production of good

d. Taking into account the indifference point of both options, i.e. the expected volume of production, which is equal to the costs of both alternatives to make or buy?

e. Availability of excess (unused) capacity that can be used in the manufacturing process, or other alternatives available to take advantage of this capacity.

Example No.4 : Iraqi Company manufactures a refrigerator-size. 14, at the same time you buy the compressor main engine of the local market at \$ 100 per compressor, a technical committee was formed within the company to evaluate the possibility of making this part in the company's workshops where there is capacity and surplus space for it (there are no other alternatives available to use this capacity). In order to cover the company's need for 2000 compressors, this topic was studied and the following estimates were:

Direct materials. \$ 40 / compressor

Direct labor. \$ 20 / compressor

Variable F.O.H \$ 10 / compressor

Common Fixed F.O.H \$ 200000

Fixed F.O.H for the manufacturing process. \$ 50000

Required: Using a differential cost analysis, indicate decision to buy or make a 2000 compressor.

The solution:

Differential costs analysis for decision of Buy or Make

Items	Buy	Make	Difference
Purchase Cost	\$200000	--	\$200000
D. Materials	--	\$80000	(80000)
D. Labor	--	40000	(40000)
V. F.O.H	--	20000	(20000)
Common F. F.O.H	200000	200000	--
F. F.O.H for the manufacturing process	--	50000	(50000)
Total Costs	400000	390000	10000

Decision: The Company should start making the compressor internal rather than buying it because it saves \$10000.

It is noted that each item that has changed is considered to be a relevant cost other than common fixed costs, where it has not been affected for both alternatives. Moreover, the company has unused spare capacity that can be used in the manufacturing process because there are no other alternatives available to use this capacity in other requirements that generate returns for the company. It means the opportunity cost is zero.

For the purpose of clarification when there is an available alternative for capacity and surplus space, the following example is shown:

Example No.5 : Referring to example No. 4, assuming that when the compressor is manufactured internally, the company will lose \$18000 in revenue as a result of having another available alternative is to rent the space available to others.

Required: Using the differential cost analysis, indicate your decision to buy or make a 2000 compressor.

The solution:

Differential costs analysis for decision of Buy or Make

Items	Buy	Make	Difference
Purchase Cost	\$200000	--	\$200000
D. Materials	--	\$80000	(80000)
D. Labor	--	40000	(40000)
V. F.O.H	--	20000	(20000)
Common F. F.O.H	200000	200000	---
F. F.O.H for the manufacturing process	--	50000	(50000)
Opportunity Cost		18000	(18000)
Total Costs	400000	408000	(8000)

Decision: The company should reject the committee's proposal to manufacture internally and keep buying from external, as this reduces costs by \$8000.

3. Adding and Dropping Product Line:

Using the relevant costs in the process of differential analysis for decision-making in the short term and on the process of addition or dropping of one product or one of the production lines at the production facilities that handle more than one product, where more than one production line, as seen in the analysis of the profitability of these facilities for each product individually by comparing income with the cost without knowing any of the costs of the appropriate decision-making process, where decisions are made speedy, without a thorough examination to exclude a particular product does not achieve a profit and these decisions are often incorrect (misleading).

Example No.6 : Sunshine Co. produces and sells three models of products; (A, B & C). Its income statement for 2023 showed a profit for the firm as a whole. However, one of the three product lines reported a loss as shown below:

Items	Models			Total
	A	B	C	
Sales	\$ 300000	400000	200000	900000
-V. Costs	(200000)	(280000)	(160000)	(640000)
C.M	100000	120000	40000	260000
-F. Costs	(70000)	(80000)	(50000)	(200000)
Net income	30000	40000	(10000)	60000

The manager of the company decided a drop the (C) product line because of its losses of \$10000.

The amount of \$ 50000 for fixed costs of which \$ 20000 is the supervisor's salary that can be eliminated (canceled) if line (C) is dropped. The productive capacity that had been used for product (C) will now be unused to produce the additional product.

Required: According to the differential analysis of revenue and costs, do you agree with the firm's decision to drop product (C) and keep production of other producers (A) and (B) only, or continue production of the entire assortment (A, B, and C).

The solution:

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Differential analysis of revenue and costs

Items	Keep C (Original Case) A + B + C	Dropping C (Alternative Case) A + B	Difference
Sales	900000	700000	
- V. Costs	(640000)	(480000)	(200000)
C.M	260000	220000	160000
- F. Costs	(200000)	(180000)*	(40000)
Net income	60000	40000	20000
			(20000)

*F.C. (A) product + F.C. (B) product + Unavoidable F.C. (C) product

$$\$ 70000 + \$ 80000 + \$ 30000 = \$ 180000$$

Decision: The Company must be continued to produce product (C) because it avoids a loss of \$20000.

Example No.7: Referring to example No.6, Assume the productive capacity that had been used for product (C) will now be used to produce additional product (B), increasing the sales of product (B) from \$ 400000 to \$ 550000.

Required: According to the differential analysis of revenues and costs, do you agree with the company's decision to a dropping product (C) and produce additional product (B), or continue production of the entire assortment (A, B, and C)?

The solution:**Differential analysis of revenue and costs**

Items	Keep C (Original Case) A + B + C	Dropping C & Excess B (Alternative Case) A + B ⁺	Difference
Sales	900000	850000	(50000)
-V. Costs	(640000)	(585000)*	55000
C.M	260000	265000	5000
-F. Costs	(200000)	(180000)	20000
Net income	60000	85000	25000

$$* \therefore \text{V.C ratio for (B)} = 280000 \div 400000 \times 100\% = 70\%$$

$$\therefore \text{V.C for sales (B}^+ \text{ \$550000)} = 550000 \times 70\% = \$385000$$

$$\therefore \text{Total V.C (A+B}^+) = \underline{200000} \text{ (A)} + \underline{385000} \text{ (B}^+) = \$ 585000$$

Decision: The company should drop product (C) and additional product (B) because it makes \$25000 in profit.

4. Scarce Resources Allocation

Business (Enterprise) Managements seek to exploit the available productive resources for the best use of the available resources (Materiality and human) but may face some difficulties in the provision of adequate economic resources in the short term, and may not be able to accept all opportunities to achieve higher profits, in the case was one of the productivity of the resources of